XRD and AFM studies of ZnS thin films produced by electrodeposition method.

ABSTRACT

The structure and morphology of ZnS thin films were investigated. ZnS thin films have been grown on an indium tin oxide glass substrate by electrodeposition method using zinc chloride and sodium thiosulfate solutions at room temperature. The X-ray diffraction patterns confirm the presence of ZnS thin films. From the AFM images, grain size decreases as the cathodic potential becomes more negative (from −1.1 to −1.3 V) at various deposition periods. Comparison between all the samples reveals that the intensity of the peaks increased, indicating better crystalline phase for the films deposited at −1.1 V. These films show homogeneous and uniform distribution according to AFM images. On the other hand, XRD analysis shows that the number of ZnS peaks increased as deposition time was increased from 15 to 30 min at −1.1 V. The AFM images show thicker films to be formed at −1.1 V indicating more favourable condition for the formation of ZnS thin films.

Keyword: Complexing agent; Electrodeposition; Thin film; Zinc sulphide.